TECHNICAL REVIEWERS' RATING SUMMARY

G-010-B
"Surface Tiltmeter Study of a Bakken Fracture Stimulation"
Submitted by: Marathon Oil Company
Principal Investigator: Ken Dunek & Glynn Williams
Request for $120,000; Total Project $240,000
Duration: 5 months

Project Description

Marathon Oil Company requests funds to conduct a surface tiltmeter study of a fracture stimulation of a middle Bakken test to be drilled in Dunn County in the first half of 2007. A titlmeter study is a technology employed to measure the direction of a fracture created in the subsurface by measuring movement or deflection at the surface. The results of such studies are then compared to projected natural subsurface fracture patterns to determine if the desired artificial/stimulated fracture orientation was attained.

Technical Advisor's Recommendation: FUND

I recommend that this project be funded for the total amount requested.

It is my understanding that the technology recommended for this project is suitable to attain the desired results. Marathon provides this project with a large and very competent technical staff. At this time Marathon is also recommending that a vertical seismic profile be run in the same borehole. By doing so they are maximizing the utility of the data set being collected.

Geologically the project is sound and an appropriate location for the project has been recommended. It can be shown that the middle Bakken reservoir in the Marathon project area is fractured and therefore well productivity should be enhanced by the proper orientation of stimulated fractures. Use of this technology will probably be limited to that geographic area within the State where productivity from the middle Bakken reservoir is significantly enhanced by natural fractures.

As pointed out in the technical reviews there are many problems associated with the development of a successful middle Bakken play in North Dakota. These problems are brought about in part by the fact that in North Dakota there are a series of facies; unlike in Montana where there is a single producing reservoir facies. These facies can be significantly different from each other. Because of these differences, one set of procedures may not be adequate to develop the play in multiple reservoir facies. It is therefore necessary that a variety of technologies be reviewed and attempted prior to developing a successful drilling and completion template for each reservoir facies.